

Aurojit Panda

Curriculum Vitae

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Research Interests

Computer Systems, Distributed Systems, Networking

Professional Employment

Aug 2018– **Assistant Professor**, *Courant Institute, New York University*, New York, NY.

Apr **Software Developer**, *Nefeli Networks*, Berkeley, CA.

2017–Aug 2018 Working on a NFV platform based on E2, NetBricks and Bess.

2011–2017 **Research Assistant**, *UC Berkeley*, Berkeley, CA.

2008–2011 **Software Developer**, *Microsoft*, Redmond, WA.

- Worked on the kernel for Midori, an experimental operating system based on Singularity.
- Designed, implemented and maintained Midori's performance counting and event logging infrastructure.
- Designed and implemented timer infrastructure for Midori. Midori relied purely on core-local time and allowed applications to specify a tradeoff between time accuracy and performance.
- Ported Midori from x86-64 to NVidia's Tegra2 multicore ARM processor.

Summer '07 **Software Engineering Intern**, *Electronic Arts*, Redwood City, CA.

- Developed memory management tools for the PlayStation 3.

Summer '06 **Software Engineering Intern**, *Bloomberg LP*, New York, NY.

- Developed network debugging tools for inferring the cause for latency spikes in data transfer from financial markets.

Education

2011–2017 **Ph.D. Computer Science**, *University of California*, Berkeley, CA.

Advisor: Scott Shenker

2004–2008 **Sc.B. Math–Computer Science**, *Brown University*, Providence, RI.

Honors in Math–Computer Science

Advisor: Meinolf Sellmann

Teaching Experience

Fall '13 **TA for EE122 (Undergraduate Networking)**, *UC Berkeley*, Berkeley, CA.

- Taught about 20 students in a weekly discussion section.
- Designed problem sets and projects, ran a project involving plug computers

- 2006–2008 **Undergraduate TA**, *CS Department, Brown University*, Providence, RI.
- TAed CS51 (Models of Computation), CS138 (Distributed Computing), CS166 (Security), CS167 (Operating Systems) and CS169 (Operating Systems Lab).
 - Helped with designing new content and projects for distributed systems and security.
 - Helped design and grade problem sets and projects.
- Fall '05 **Reader**, *Math Department, Brown University*, Providence, RI.
- Graded problem sets and exams for Honors Linear Algebra.

Awards

- Demetri Angelakos Memorial Achievement Award, Berkeley EECS 2016-17
- Best Student Paper, SIGCOMM 2015
- Best Paper, EuroSys 2013
- Qualcomm Innovation Fellowship 2012

Publications

Conferences

- Aurojit Panda, Ori Lahav, Katerina Argyraki, Mooly Sagiv, and Scott Shenker. Verifying Reachability in Networks with Mutable Datapaths. In *NSDI*, 2017.
- Aurojit Panda, Wenting Zheng, Xiaohe Hu, Arvind Krishnamurthy, and Scott Shenker. SCL: Simplifying Distributed SDN Control Planes. In *NSDI*, 2017.
- Shivaram Venkataraman, Aurojit Panda, Kay Ousterhout, Ali Ghodsi, Michael J. Franklin, Benjamin Recht, and Ion Stoica. Drizzle: Fast and adaptable stream processing at scale. In *SOSP*, 2017.
- Marco Chiesa, Ilya Nikolaevskiy, Slobodan Mitrovic, Aurojit Panda, Andrei Gurtov, Aleksander Madry, Michael Schapira, and Scott Shenker. The Quest for Resilient (Static) Forwarding Tables. In *INFOCOM*, 2016.
- Ethan J Jackson, Melvin Walls, Aurojit Panda, Justin Pettit, Ben Pfaff, Jarno Rajahalme, Teemu Koponen, and Scott Shenker. SoftFlow: A Middlebox Architecture for Open vSwitch. In *USENIX ATC*, 2016.
- Oded Padon, Kenneth McMillan, Aurojit Panda, Mooly Sagiv, and Sharon Shoham. Ivy: Interactive Verification of Parametrized Systems via Effectively Propositional Reasoning. In *PLDI*, 2016.
- Aurojit Panda, Sangjin Han, Keon Jang, Melvin Walls, Sylvia Ratnasamy, and Scott Shenker. NetBricks: Taking the V out of NFV. In *OSDI*, 2016.
- Colin Scott, Aurojit Panda, Vjeko Brajkovic, George Nacula, Arvind Krishnamurthy, and Scott Shenker. Minimizing Faulty Executions of Distributed Systems. In *NSDI*, 2016.

- Yaron Velner, Kalev Alpernas, Aurojit Panda, Alexander Rabinovich, Mooly Sagiv, Scott Shenker, and Sharon Shoham. Some Complexity Results for Stateful Network Verification. In *TACAS*, 2016.
- Shoumik Palkar, Chang Lan, Sangjin Han, Aurojit Panda, Keon Jang, Sylvia Ratnasamy, Luigi Rizzo, and Scott Shenker. E2: A Framework for Network Function Virtualization. In *SOSP*, 2015.
- Justine Sherry, Peter X. Gao, Soumya Basu, Aurojit Panda, Arvind Krishnamurthy, Christian Maciocco, Maziar Manesh, João Martins, Sylvia Ratnasamy, Luigi Rizzo, and Scott Shenker. Rollback Recovery for Middleboxes. In *SIGCOMM*, 2015.
- Colin Scott, Andreas Wundsam, Barath Raghavan, Aurojit Panda, Andrew Or, Jefferson Lai, Eugene Huang, Zhi Liu, Ahmed El-Hassany, Sam Whitlock, H.B. Acharya, Kyriakos Zarifis, and Scott Shenker. Troubleshooting Blackbox SDN Control Software with Minimal Causal Sequences. In *SIGCOMM*, 2014.
- Shivaram Venkatraman, Aurojit Panda, Ganesh Ananthanarayanan, Michael Franklin, and Ion Stoica. The Power of Choice in Data-Aware Cluster Scheduling. In *OSDI*, 2014.
- Sameer Agarwal, Barzan Mozafari, Aurojit Panda, Henry Milner, Samuel Madden, and Ion Stoica. BlinkDB: Queries with Bounded Errors and Bounded Response Times on Very Large Data. In *EuroSys*, 2013. Best Paper.
- Junda Liu, Aurojit Panda, Ankit Singla, Brighten Godfrey, Michael Schapira, and Scott Shenker. Ensuring Connectivity via Data Plane Mechanisms. In *NSDI*, 2013.
- Joan Feigenbaum, Brighten Godfrey, Aurojit Panda, Michael Schapira, Scott Shenker, and Ankit Singla. Brief Announcement: On the Resilience of Routing Tables. In *PODC*, 2012.
- Daniel Heller, Aurojit Panda, Meinolf Sellmann, and Justin Yip. Model Restarts for Structural Symmetry Breaking. In *CP*, 2008.

Journals

- James McCauley, Zhi Liu, Aurojit Panda, Teemu Koponen, Barath Raghavan, Jennifer Rexford, and Scott Shenker. Recursive SDN for Carrier Networks. *SIGCOMM Computer Communication Review*, 46(3), 2016.
- Aurojit Panda, James Murphy McCauley, Amin Tootoonchian, Justine Sherry, Teemu Koponen, Sylvia Ratnasamy, and Scott Shenker. Open Network Interfaces for Carrier Networks. *SIGCOMM Computer Communication Review*, 46(1):5–11, 2016.

Workshops

- Abhiram Balasubramanian, Marek S. Baranowski, Anton Burtsev, Aurojit Panda, Zvonimir Rakamaric, and Leonid Ryzhyk. System Programming in Rust: Beyond Safety. In *HotOS*, 2017.

- Aurojit Panda, Mooly Sagiv, and Scott Shenker. Verification in the Age of Microservices. In *HotOS*, 2017.
- Ignacio Castro, Aurojit Panda, Barath Raghavan, Scott Shenker, and Sergey Gorinsky. Route Bazaar: Automatic Intedomain Contract Negotiation. In *HotOS*, 2015.
- Aurojit Panda, Katerina Argyraki, Mooly Sagiv, Michael Schapira, and Scott Shenker. New Directions for Network Verification. In *SNAPL*, 2015.
- Wenfei Wu, Li Erran Li, Aurojit Panda, and Scott Shenker. PRAN: Programmable Radio Access Networks. In *HotNets*, 2014.
- Sangjin Han, Norbert Egi, Aurojit Panda, Sylvia Ratnasamy, Guangyu Shi, and Scott Shenker. Network Support for Resource Disaggregation in Next-Generation Datacenters. In *HotNets*, 2013.
- James McCauley, Aurojit Panda, Martin Casado, Teemu Koponen, and Scott Shenker. Extending SDN to Large-Scale Networks. In *ONS Research Track*, 2013.
- Kay Ousterhout, Aurojit Panda, Joshua Rosen, Shivaram Venkataraman, Reynold Xin, Sylvia Ratnasamy, Scott Shenker, and Ion Stoica. The Case for Tiny Tasks in Compute Clusters. In *HotOS*, 2013.
- Aurojit Panda, Colin Scott, Ali Ghodsi, Teemu Koponen, and Scott Shenker. CAP for Networks. In *HotSDN*, 2013.
- Debayan Gupta, Aaron Segal, Aurojit Panda, Gil Segev, Michael Schapira, Joan Feigenbaum, Jenifer Rexford, and Scott Shenker. A New Approach to Interdomain Routing Based on Secure Multi-Party Computation. In *HotNets*, 2012.

Demos

- Sameer Agarwal, Anand P Iyer, Aurojit Panda, Samuel Madden, Barzan Mozafari, and Ion Stoica. Blink and It's Done: Interactive Queries on Very Large Data. In *VLDB*, 2012.

Technical Reports

- Marco Chiesa, Ilya Nikolaevkiy, Aurojit Panda, Andrei Gurtov, Michael Schapira, and Scott Shenker. Exploring the Limits of Static Failover Routing. *arXiv preprint arXiv:1409.0034*, 2014.
- Aurojit Panda, Ori Lahav, Katerina Argyraki, Mooly Sagiv, and Scott Shenker. Verifying Isolation Properties in the Presence of Middleboxes. *arXiv preprint arXiv:1409.7687*, 2014.

Invited Talks

A New Approach to Network Function Virtualization

- o USC. February 2017.
- o NYU. February 2017.

- University of Wisconsin. February 2017.
- University of Chicago. March 2017.
- MPI SWS. March 2017.
- EPFL. March 2017.
- UT Austin. April 2017.
- Microsoft Research. April 2017.
- IETF NFV Research Group. September 2017.

NetBricks: Taking the V out of NFV

- Intel Research. October 2016
- Google Platforms and Networking. October 2016

VMN: Verifying Networks with Mutable Datapaths

- Invited speaker at NetPL. August, 2016.
- Dagstuhl - Formal Foundations for Networking. February 2015.

Service

- Reviewer for Journal of Applied Logic, Transactions on Networking, SOSR 2018. External Reviewer for ESOP 2017, POPL 2017, SOSR 2016, PLDI 2015, ICDE 2013.
- Industry Liaison for the Berkeley Computer Science Graduate Student Association.

References

Prof. Scott Shenker

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Prof. Ion Stoica

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